Subcommittee on Hydrology (SOH)

Report on 2016 Activities and Accomplishments

ACWI Annual Meeting

Feb 23, 2017

Robert Mason, Chair
United States Geological Survey

Dr. Siamak Esfandiary, Vice-Chair
Federal Emergency Management Agency

Subcommittee On Hydrology

Purpose

Improve the availability and reliability of surface-water quantity information needed for hazard mitigation, water supply and demand management, and environmental protection.

Activities

Quarterly Meetings, Work Groups, Work Group Meetings, Announcements, Conferences.

Website

http://acwi.gov/hydrology/index.html

SOH Member Organizations

1. Agricultural Research Service (ARS)
2. Association of State Floodplain Managers (ASFPM)
3. BECKER
4. Bureau of Land Management (BLM)
5. Bureau of Reclamation (USBR)
6. Environmental Protection Agency (EPA)
7. Federal Emergency Management Agency (FEMA)
8. Federal Energy Regulatory Commission (FERC)
9. Federal Highway Administration (FHWA)
10. Forest Service (USFS)
11. National Aeronautics and Space Administration (NASA)
12. National Hydrologic Warning Council (NHWC)
13. National Science Foundation (NSF)
14. Natural Resources Conservation Service (NRCS)
15. NOAA National Weather Service (NWS)
16. Nuclear Regulatory Commission (NRC)
17. Office of Surface Mining (OSMRE)
18. Tennessee Valley Authority
19. U.S. Army Corps of Engineers (USACE)
20. United States Geological Survey (USGS)

SOH Work Groups

- Hydrologic Frequency Analysis Work Group (HFAWG)
- Extreme Storm Events Work Group (ESEWG)
- Hydrologic Modeling Work Group (HMWG)
- Satellite Telemetry Interagency Work Group (STIWG)
- Initiation of Streamflow Information Collaborative
- Proposed work group on filling “data gaps”

SOH Satellite Telemetry Interagency Work Group (STIWG)

LySanias Broyles, Chair US Army Corps of Engineers (USACE)

Purpose, Goals, and Accomplishments:

- ❑ User group for the Geostationary Operational Environmental Satellite (GOES) Data Collection System (DCS).
- ❑ Advises NOAA National Environmental Satellite, Data, and Information Service (NESDIS) on matters concerning satellite data relay user requirements
- ❑ Undertakes projects to benefit the GOES DCS community
- ❑ Established new TOR in 2017
- ❑ Serves as clearing house on value of GOES and radio spectrium issues)

SOH Hydrologic Modeling Work Group (HMWG)

- **Jerry Webb, Chair** US Army Corp of Engineers (USACE)
- **Claudia Hoeft, Technical Chair 5th FIHMC, (**USDA NRCS)

Purpose, Goals, and Accomplishments:

- ❑Promote sharing of information on modeling tools and modeling systems in hydrology and water resources.
- ❑Plans, organizes, and promotes the Federal Interagency Hydrologic Modeling Conference every four/five years and
- ❑Engages in other modeling related activities as appropriate.
- ❑Held the 15th Federal SED-HYD Conference 4/19-23, 2015
  - ❑ 350 people attended; 240 tech papers and extended abstracts were presented. 11 short courses

SOH Hydrologic Frequency Analysis Work Group (HFAWG)

- **Will Thomas, Chair,** Michael Baker International/ASFPM
- **John England, Vice-Chair,** US Army Corps of Engineers (USACE)

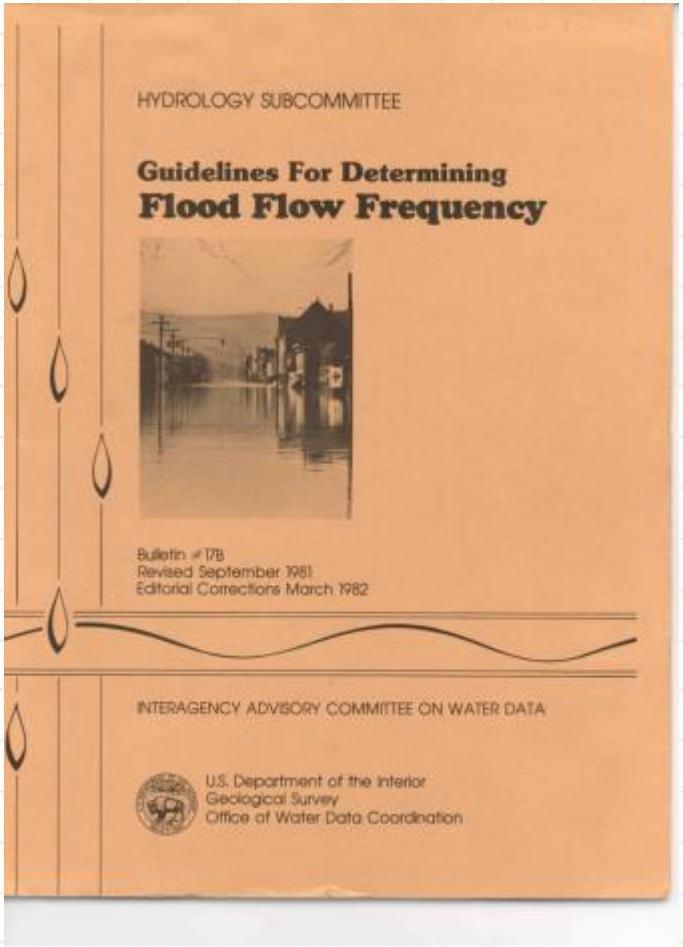
Purpose and Goals:

- ❑ recommend procedures to increase the usefulness of the current guidelines for Hydrologic Frequency Analysis computations,
- ❑ evaluate other procedures for frequency analysis of hydrologic phenomena, and
- ❑ forward draft papers and recommendations to the Subcommittee on Hydrology of ACWI for appropriate action.

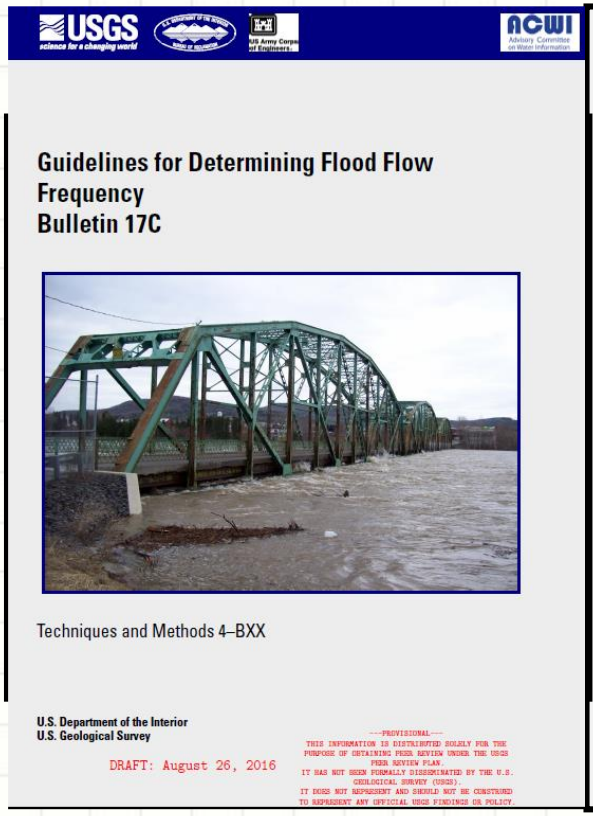
SOH Hydrologic Frequency Analysis Work Group (HFAWG)

Updating Bulletin 17B Guidelines:

- Published in March 1982, based on research from 1960s and 1970s
- HFAWG is updating Bulletin 17B using pertinent research since 1982
- Incorporating new statistical procedures for analyzing historical floods and nonstandard flood data and adjusting for low floods
- http://water.usgs.gov/osw/bulletin17b/bulletin_17B.html



SOH Hydrologic Frequency Analysis Work Group (HFAWG)



Guidelines for Determining Flood Flow Frequency - Bulletin 17C

Improvements

1. *Historical Information, Interval Data and Low and Zero flows*
2. *Low Outlier Identification*
3. *Confidence Intervals*
4. *Estimation of Regional Skew*
5. *Plotting Positions*
6. *New Statement on Climate Change*
7. *Deletion of Expected Probability*

SOH Hydrologic Frequency Analysis Work Group (HFAWG)

- Bulletin 17C, to be published by USGS, is considered "highly influential science" and a Communication Plan was prepared that describes:
  - Subject and purpose of the publication
  - Impact of dissemination
  - Details on the USGS review process and requisite experience of the peer reviewers
- Draft versions of Bulletin 17C and supporting materials and software links are posted on the SOH/HFAWG web site (https://acwi.gov/hydrology/Frequency/b17c/)

SOH Hydrologic Frequency Analysis Work Group (HFAWG)

Progress since the October 2015 ACWI meeting

* As discussed at the 2015 ACWI meeting, Bulletin 17C will be published as USGS Techniques and Methods Report
* December 2015 – Prepared a revised draft of Bulletin 17C based on comments from HFAWG and SOH members
* February to April 2016 – Public comment period on December 29, 2015 draft of Bulletin 17C – 50 comments were received
* April 2016 – Most comments were positive, supportive and suggested minor revisions, new section on extrapolation was added
* June 2016 – SOH approved five external peer reviewers for USGS review process of a "highly influential" scientific report

SOH Hydrologic Frequency Analysis Work Group (HFAWG)

Progress since August 2015 ACWI meeting

- July 2016 – Co-authors of Bulletin 17C drafted responses to the 50 public review comments
- August 2016 – revised version of Bulletin 17C prepared based on public comments
- September 2016 – SOH voted that responses to public comments were adequate and Chair, SOH, sent August 2016 version of Bulletin 17C to USGS peer reviewers
- February 2017 – One set of USGS peer review comments are still outstanding

SOH Hydrologic Frequency Analysis Work Group (HFAWG)

- **The Path Forward**
  - Co-authors will develop responses to USGS peer reviewer comments and share with HFAWG/SOH members
  - Bulletin 17C will be revised as appropriate based on the USGS peer review comments
  - Bulletin 17C will be published when SOH members concur that peer review comments have been addressed
  - Software, examples, and training materials posted on the HFAWG web site
  - Training courses will be offered through Federal agencies and technical conferences
  - Additional outreach through presentations at technical conferences

SOH Extreme Storm Events Work Group (ESEWG)

- **Thomas J. Nicholson, Chair** U.S. Nuclear Regulatory Commission (USNRC)
- **William Otero, Vice-Chair** U.S. Army Corps of Engineers (USACE)

Purpose and Goals:

- ❑ Coordinate studies and databases for reviewing and improving methodologies and data collection techniques used to develop design precipitation estimates of large storm events up to and including the Probable Maximum Precipitation (PMP).
- ❑ Develop a detailed scope of work/plan of study, and
- ❑ Determine the necessary funding requirements to update the Catalog of Extreme Storms and Hydrometeorological Reports (HMR) for estimating PMP.

SOH Extreme Storm Events Work Group (ESEWG)

Key Activities and Findings

- Workshop and Follow-up on Probabilistic Flood Hazard Assessment, January 29-31, 2013 in Rockville, MD
  - *See proceedings:* http://acwi.gov/hydrology/minutes/PFHAWorkshopProgram.pdf
- ESEWG May 2014 Workshop and Follow-Up
  - *defined needed extreme precipitation products*
  - *collected feedback from Federal, State agencies, and member organizations of the ICODS and NDSRB on their user needs for Extreme Storm data and services, and*
  - *established ESEWG Proposal Writing Team (PWT) to identify Extreme Rainfall Product Needs for the U.S.*
- Meeting on Uncertainty Analysis for Probable Maximum Precipitation Estimates, May 18, 2015

SOH Extreme Storm Events Work Group (ESEWG)

Key Activities and Findings

Broad Recommendations from Scientists, Regulatory Agencies, and Dam Owners including 21 States and 8 Federal Agencies to address needs:

* Update NOAA Hydrometeorological Reports using Recent Storm Data
* Develop Guidance to Review Regional and Site-Specific PMP Estimates
* NOAA Atlas 14 Completion and Future Updates
* U.S. Extreme Precipitation Database
* Guidance for using Statistical Approaches to Update PMP Estimates

- **Briefing** on ***USACE's HEC – MetVue: A Tool to Analyze Rainfall Data from Storm Events*** by Charles McWilliams, USACE - Omaha District
- **Meeting** on ***NASA's Precipitation Monitoring Program*** including the Global Precipitation Monitoring Mission by Dr. George Huffman, NASA – Goddard Space Flight Center

Recommendations from Workshops and Meetings with Stakeholders

1. Coordinate Studies and Database

- ❑ Maintain and post active list of Extreme Storms Studies (such as PMP studies)
- ❑ Develop central repository for precipitation data collected by Work Group organizations and foster data agreement with respective agencies.

2. Develop a detailed scope of work/plan of study

- ❑ Work with the ESEWG Proposal Writing Team (PWT) to complete detailed scope of work/plan of study

3. Determine necessary funding requirements to pursue rainfall product needs

- ❑ Next step is to present proposal with funding needs to SOH and then onto ACWI
- ❑ Focus should be on highest priority needs to include guidance and shared databases for regional and site-specific PMP estimates; and for Probabilistic Flood Hazard Assessments.

Proposal for Streamflow Information Collaborative Work Group

- Coordinate national streamflow information network priorities.
- Identify opportunities for coordination, innovation, technical transfer, training, and leveraging of resources (including foundational datasets, data management systems, and scientific tools).
- Create cohesive strategies which address the value, uses, economic benefits, and critical gaps in our Nation's streamflow network.
- Develop effective mechanisms to "get the word out" (telling "our" story" (web portal, social media)).
- Increase engagement and knowledge with the data partners and stakeholders of streamflow information.

Proposal for Streamflow Information Collaborative Work Group – (cont.)

- Develop issues for future priorities:
  - estimation of flows at ungaged streams
  - quantifying errors and uncertainty
- Develop recommendations for future SOH consideration in supporting the national streamflow information network.

Streamflow Information Collaborative Activities To Date

- Approximate Monthly Conference Calls since May 2016
- Development and Finalization of Streamflow Information Collaborative Charter
- Exchange of information on previous committees, identifying information needs of this work group, previous streamgage network evaluations, and network gap analysis

Upcoming Activities

- Present and discuss other networks
  - SNOTEL
  - National Water Model
  - Partner networks
- Network Evaluation and Optimization
  - Internal USGS work group
  - Others

Proposal for a Work Group on observational needs and filling data gaps

- To report on the current procedures for dealing with missing or non existent spatial and temporal hydrologic data.
- To identify and describe potential new technologies for dealing with missing data.

Proposal for a Work Group on observational needs and filling data gaps, report outline.

- Comprehensive description of the problem
- Literature review, not comprehensive
- Description of procedures currently used by agencies, consultants, etc..
- Identify new technologies
- List of selected references
- Summary and recommendations

Questions?